

**REMARKS**

**I. STATUS OF THE CLAIMS**

Claims 1, 4, 7-16, 19, 20, 23, 26, 32, 33, 36 and 37 are pending and under consideration.

Claims 1, 12, 19 and 33 have been amended. Proper support for the amendments to the claims can be found in the specification at least at paragraph [0034] of the specification.

Claims 34 and 35 have been cancelled without prejudice to or disclaimer of the subject matter recited therein.

Claims 1, 12, 19 and 33 are the independent claims.

No new matter is believed to have been added. Reconsideration is respectfully requested.

**II. THE REJECTION UNDER 35 U.S.C. §102 AND §103**

Claims 1, 3, 4, 7-16, 19, 20, 22, 23, 26, 32, 33, 36 and 37 are rejected under 35 U.S.C. §102(b)/103(a) as being anticipated by, or alternatively unpatentable over, Evans et al. (US Patent 4,302,520).

Applicants respectfully traverse this rejection for at least the following reasons.

Claims 3 and 22 have been previously cancelled without prejudice or disclaimer of the subject matter recited therein. Accordingly, the rejection of claims 6 and 25 is moot.

Regarding the rejection of independent claims 1 and 12, it is noted that claims 1 and 12, as amended, recite a lithium-sulfur battery comprising, amongst other novel features, a positive electrode having porosity between 5% and 65% of a volume of the positive electrode. Applicants respectfully assert that Evans fails to teach or suggest such novel features recited in the amended claims.

Upon a detailed review of Evans, it is noted that Evans discloses a non-aqueous cell utilizing a highly active metal anode, a cathode and a liquid organic electrolyte (column 1, lines 8-14), but fails to teach or suggest porosity of an electrode. In particular, Evans fails to teach or fairly suggest a positive electrode having porosity between 5% and 65% of a volume of the

positive electrode, as recited in amended independent claims 1 and 12.

Accordingly, Applicants respectfully assert that the rejection of claims 1 and 12 under 35 U.S.C. §§102(b)/103(a) should be withdrawn because Evans fails to teach or suggest each feature of independent claims 1 and 12, as amended.

Furthermore, Applicants respectfully assert that dependent claims 4, 7-11, 13-16, 36 and 37 are allowable at least because of their dependence from claims 1 and 12, and because they include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claims 4, 7-11, 13-16, 36 and 37 also distinguish over the prior art.

Regarding the rejection of independent claim 19, it is noted that claim 19 recites an electrolyte for use in a lithium sulfur battery having electrodes comprising, amongst other novel features, a positive electrode having porosity between 5% and 65% of a volume of the positive electrode.

As noted above, Evans discloses a non-aqueous cell utilizing a highly active metal anode, a cathode and a liquid organic electrolyte (column 1, lines 8-14), but fails to teach or suggest porosity of an electrode. In particular, Evans fails to teach or fairly suggest a positive electrode having porosity between 5% and 65% of a volume of the positive electrode, as recited in amended independent claim 19.

Accordingly, Applicants respectfully assert that the rejection of claim 19 under 35 U.S.C. §§102(b)/103(a) should be withdrawn because Evans fails to teach or suggest each feature of independent claim 19, as amended.

Furthermore, Applicants respectfully assert that dependent claims 20, 23, 26 and 32 are allowable at least because of their dependence from claim 19, and because they include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claims 20, 23, 26 and 32 also distinguish over the prior art.

Regarding the rejection of independent claim 33, it is noted that claim 33 recites a method of manufacturing a lithium-sulfur battery, comprising, amongst other novel features, a positive electrode having porosity of at least 5% and no greater than 65% of a volume of the positive electrode.

As noted above, Evans discloses a non-aqueous cell utilizing a highly active metal anode, a cathode and a liquid organic electrolyte (column 1, lines 8-14), but fails to teach or

suggest porosity of an electrode. In particular, Evans fails to teach or fairly suggest a positive electrode having porosity of at least 5% and no greater than 65% of a volume of the positive electrode, as recited in amended independent claim 33.

Accordingly, Applicants respectfully assert that the rejection of claim 33 under 35 U.S.C. §§102(b)/103(a) should be withdrawn because Evans fails to teach or suggest each feature of independent claim 33, as amended.

Furthermore, Applicants note that dependent claims 34 and 35 have been cancelled without prejudice or disclaimer of the subject matter recited therein. Therefore, the rejection of claims 34 and 25 is moot.

Claims 1, 3, 4, 7-11, 19, 20, 22, 23, 26, 32, 33 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vourlis (US Patent 5,432,030).

Applicants respectfully traverse this rejection for at least the following reasons.

As noted above, claims 3 and 22 have been cancelled without prejudice or disclaimer of the subject matter recited therein. Accordingly, the rejection of claims 6 and 25 is moot.

Regarding the rejection of independent claims 1 and 12, it is noted that claims 1 and 12, as amended, recite a lithium-sulfur battery comprising, amongst other novel features, a positive electrode having porosity between 5% and 65% of a volume of the positive electrode. Applicants respectfully assert that Vourlis fails to teach or suggest such novel features recited in the amended claims.

Upon a detailed review of Vourlis, it is noted that Vourlis discloses an electrochemical cell, such as a rechargeable Li/FeS<sub>2</sub> cell, employing an improved electrolyte comprising a solvent mixture of 1,3-dioxolane (DIOX), 1,2-dimethoxyethane (DME) and 3-methyl-2-oxazolidine (3Me2Ox) with a lithium-based solute such as LiI or LiCF<sub>3</sub>SO<sub>3</sub> (column 1, lines 7-13), but fails to teach or suggest porosity of an electrode. In particular, Vourlis fails to teach or fairly suggest a positive electrode having porosity between 5% and 65% of a volume of the positive electrode, as recited in amended independent claims 1 and 12.

Accordingly, Applicants respectfully assert that the rejection of claims 1 and 12 under 35 U.S.C. §103(a) should be withdrawn because Vourlis fails to teach or suggest each feature of independent claims 1 and 12, as amended.

Furthermore, Applicants respectfully assert that dependent claims 4, 7-11, 13-16, 36 and 37 are allowable at least because of their dependence from claims 1 and 12, and because they include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claims 4, 7-11, 13-16, 36 and 37 also distinguish over the prior art.

Regarding the rejection of independent claim 19, it is noted that claim 19 recites an electrolyte for use in a lithium sulfur battery having electrodes comprising, amongst other novel features, a positive electrode having porosity between 5% and 65% of a volume of the positive electrode.

As noted above, Vourlis discloses a non-aqueous cell utilizing a highly active metal anode, a cathode and a liquid organic electrolyte (column 1, lines 7-13), but fails to teach or suggest porosity of an electrode. In particular, Vourlis fails to teach or fairly suggest a positive electrode having porosity between 5% and 65% of a volume of the positive electrode, as recited in amended independent claim 19.

Accordingly, Applicants respectfully assert that the rejection of claim 19 under 35 U.S.C. §103(a) should be withdrawn because Vourlis fails to teach or suggest each feature of independent claim 19, as amended.

Furthermore, Applicants respectfully assert that dependent claims 20, 23, 26 and 32 are allowable at least because of their dependence from claim 19, and because they include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claims 20, 23, 26 and 32 also distinguish over the prior art.

Regarding the rejection of independent claim 33, it is noted that claim 33 recites a method of manufacturing a lithium-sulfur battery, comprising, amongst other novel features, a positive electrode having porosity of at least 5% and no greater than 65% of a volume of the positive electrode.

As noted above, Vourlis discloses a non-aqueous cell utilizing a highly active metal anode, a cathode and a liquid organic electrolyte (column 1, lines 7-13), but fails to teach or suggest porosity of an electrode. In particular, Vourlis fails to teach or fairly suggest a positive electrode having porosity of at least 5% and no greater than 65% of a volume of the positive electrode, as recited in amended independent claim 33.

Accordingly, Applicants respectfully assert that the rejection of claim 33 under 35 U.S.C.

§§102(b)/103(a) should be withdrawn because Vourlis fails to teach or suggest each feature of independent claim 33, as amended.

Furthermore, Applicants note that dependent claims 34 and 35 have been cancelled without prejudice or disclaimer of the subject matter recited therein. Therefore, the rejection of claims 34 and 25 is moot.

Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vourlis or Evans in view of Katz et al., (US Patent 6,358,643).

Applicants respectfully traverse this rejection for at least the following reasons.

Claims 34 and 35 have been cancelled without prejudice or disclaimer of the subject matter recited therein.

Accordingly, the rejection of claims 34 and 25 is moot.

Furthermore, it is noted that although Katz discloses a positive electrode having porosity, Katz favors an electrode having a relatively high porosity, an in particular as high as 95% or more (column 8, lines 32-34).

### III. CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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